New Jersey's Heavy-Duty Diesel Vehicle Inspection Program

Pursuant to 1995 Public Law 157, in August 1997 New Jersey adopted amendments to the N.J.A.C. 7:27- 14: Control and Prohibition of Air Pollution from Diesel-Powered Motor Vehicles and N.J.A.C. 7:27B-4: Air Test Method 4: Testing Procedures for Motor Vehicles. These amendments to the New Jersey Department of Environmental Protection (NJDEP) regulations, along with concurrent adoptions in the Motor Vehicle Code (Title 39), and regulations of the New Jersey Department of Transportation (NJDOT), N.J.A.C 13:20-26, created the Heavy-Duty Diesel Vehicle Inspection Program (HDDVIP), which is described below.

Implementation of its heavy-duty diesel emissions program was completed in two phases for Heavy-Duty Diesel Vehicles, which are trucks, commercial buses and school buses with a Gross Vehicle Weight Rating (GVWR) of 18,000 pounds or more.

Phase One introduced a pilot Roadside Enforcement Program (REP) in July, 1995 utilizing an enhanced variant of the existing self-inspection program as well as a mechanism to provide for voluntary inspections. Enforced roadside inspections, with penalties for failure, began April 1998. Phase Two commenced July, 1998 continuing the REP, and beginning an annual, periodic exhaust emissions inspection program (PIP) for heavy-duty diesel vehicles (HDDV), other than diesel buses, by Diesel Emissions Inspection Centers (DEICs) licensed by the Motor Vehicle Commission (MVC).

The REP is administered by the New Jersey MVC, in cooperation with the New Jersey State police (NJSP). Teams consisting of MVC inspectors and NJSP troopers operate mobile test facilities at selected locations, and may also perform spot roving inspections. The PIP requires annual inspections for subject vehicles to be performed at DEICs within ninety days of registration. This applies to new registrations as well as renewals. A vehicle must pass an opacity test as part of the annual registration process. NJDEP provides technical assistance, oversight and performs quality assurance functions.

Diesel buses and school buses with a GVWR of 18,000 pound or more are subject to the roadside enforcement and annual in-terminal opacity inspections performed by DVM inspectors. Trucks and other subject HDDVs are inspected at DEICs, which may be licensed to perform inspections for paying customers, or as a self-inspecting fleet.

TEST METHODS

Test methodology includes the snap-acceleration test (SAE J1667), rolling-acceleration test, and stall acceleration test for determination of exhaust smoke opacity from heavy-duty diesel vehicles (HDDVS) in a roadside environment. Road-side enforcement primarily utilizes the snap-acceleration test, with the Visible Black Smoke test employed as a visual screening mechanism to quickly identify potentially failing vehicles. DEICs may utilize any of the three approved test methods within the restrictions set forth within N.J.A.C. 7:27-14 and 7:27B-4..

Measurement apparatus (smokemeters or opacimeters) must conform to the specifications set forth by the Society of Automotive Engineers recommended practice J-1667. The testing apparatus needed by a DEIC must meet additional specifications, including the ability be to measure/monitor engine RPM and oil temperature, and otherwise satisfy N.J.A.C. 7:27B – 4.15, specifications for smokemeters.

Snap acceleration test:

This test, performed in accordance with the Society of Automotive Engineers (SAE) protocol J1667, is designed for use on a stationary vehicle, equipped with an engine speed governor, which is not under load. When tested, the vehicle's accelerator control is rapidly

depressed from the at rest (idle) position to its forward-most or downward-most position or when the primary engine power control engine is delivering the maximum potential power and fuel. This condition is known as "wide open throttle" for diesel-powered vehicles. The vehicle engine is accelerated from idle speed to the maximum governed revolutions per minute (RPM), that is, the maximum engine speed achievable on a vehicle with speed control limitations, and held at maximum RPM for three seconds. The peak smoke opacity is measured during the “accelerate and hold” sequence.

Rolling acceleration test:

The rolling acceleration test is a relatively short, on-road transient test cycle that simulates the normal operation of a heavy-duty diesel engine. The rolling acceleration test entails operating the vehicle at wide open throttle while it is loaded under its own inertia in a low gear from 200 RPM above idle speed to the maximum governed RPM. Alternatively, for a non-governed engine or a non-low speed engine, the vehicle is operated at wide open throttle under its own inertia in a low gear from 200 RPM above idle speed to approximately 2500 RPM or 12 mph, whichever occurs first. This test mode is very similar to a mode that occurs during the first segment of the EPA certification smoke cycle for heavy-duty diesel engines (40 CFR §86.884-7). The peak smoke opacity is measured during this operation.

Stall test:

The stall test is performed only on vehicles equipped with an automatic transmission. The vehicle's brakes and wheel chocks are used to keep it stationary throughout the test. The engine is accelerated at wide-open throttle in a forward drive gear from idle until the engine speed stabilizes against the transmission load. This final, steady engine speed is maintained for one to three seconds. The stall test creates a transient loaded mode for obtaining peak smoke opacity during the operating cycle.

Two visual inspections are also applied to Heavy-Duty Diesel Vehicles:

Visible Black Smoke test:

The Visible Black Smoke test is performed by beginning with the accelerator pedal in the low idle position, then rapidly depressing the accelerator pedal and accelerating the engine to wide open throttle. The accelerator pedal is held at the wide open throttle position for one to three seconds after the engine has attained maximum governed RPM or, for vehicles with automatic transmission and a high speed engine only, until the engine speed stabilizes while the transmission is engaged in a forward gear. The accelerator pedal is released, allowing the engine to idle for 15 seconds while continuing to observe the exhaust emissions for visible black smoke. If black smoke is observed at any point during the test sequence, the vehicle shall be deemed to have failed to pass the visible black smoke screening test, and may be remanded for further testing.

Emission Control Apparatus Inspection:

An inspection for the presence of emission control apparatus downstream of the exhaust ports is conducted upon vehicles with a certified engine configuration (40 CFR §86) that was originally equipped with exhaust after-treatment technology. The rule structure also prohibits the operation or sale of vehicles with tampered emission control apparatus as well as the act of tampering itself. Tampering includes any modifications from the certified configuration, additional equipment, or disabling or removal of existing emission control apparatus.

EMISSION STANDARDS

All emission standards, unless otherwise specified, are for peak smoke opacity to be determined in accordance with the test methods outlined above.

Heavy Duty 18,000+ lbs.

1973 and older- 70%
1974 or 1990 55%
1991 and newer- 40%
No visible blue smoke >3 consecutive seconds

Diesel Bus and School Bus 18,000+ lbs.

1987 and older - 40%
1988 and newer- 30%
No visible blue smoke >3 consecutive seconds

A heavy-duty diesel vehicle/engine of model year 1973 or older which has failed to meet the standards, and, having undergone unsuccessful qualified attempts to remedy the vehicle, may be subjected to a referee procedure which utilizes a diagnostic process to determine additional repairs that may be performed. Once it has been established that the HDDV/engine is incapable of meeting the applicable standard, an individual Alternative Opacity Standard will be assigned to the specific vehicle.

PROGRAM ADMINISTRATION

MVC administers roadside and diesel bus/school bus periodic testing. MVC inspectors are assisted by the NJSP who provide traffic control and enforcement authority. Periodic inspections of HDDVs are conducted by DEICs licensed by the MVC. Technical assistance, program oversight and quality assurance are provided by NJDEP. Penalty reductions are allowed upon presentation of proof of repair within a specified timeframe. Authority is given to place a vehicle out of service for frequent or unresolved violations. Violations are placed upon the vehicle owner or lessee, but not the operator.